Training Models for third secondary

Physics

Model (1)- English

2025-2026

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First : objective questions (multiple choice)"all Question of one mark"

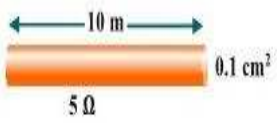
1 In the figure:

Which of the following choices correctly expresses the relations between the electric potentials of the points W, X, Y, and Z?

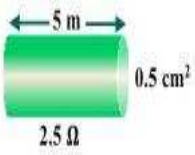
A	electric potential of the point W is greater than the electric potential of point Z	electric potential of the point X is less than the electric potential of point Y
B	electric potential of the point W is less than the electric potential of point Z	electric potential of the point X is greater than the electric potential of point Y
C	electric potential of the point W is greater than the electric potential of point Z	electric potential of the point X is greater than the electric potential of point Y
D	electric potential of the point W is less than the electric potential of point Z	electric potential of the point X is less than the electric potential of point Y

2 The figure shows two wires made of two different materials. Using the data shown in the figure, the ratio between:

$$\frac{\text{The resistivity of material of wire X}}{\text{The resistivity of material of wire Y}} = \cdots \ldots \ldots \ldots$$



Wire Y



Wire X

A	$\frac{1}{2}$
B	$\frac{2}{1}$
C	$\frac{1}{5}$
D	$\frac{5}{1}$

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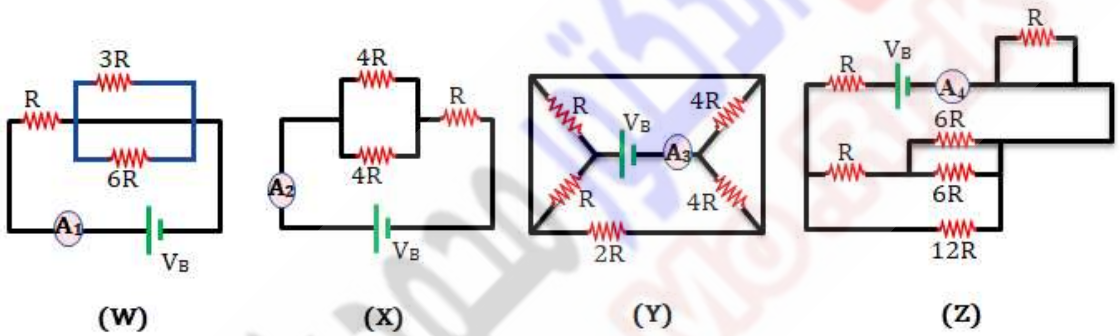
3	When a metal wire is reshaped to a length of one-third of its original length without changing its temperature, then the electric conductivity of its material.....	
	A	Reduced to a third of its original value
	B	decreased to one-ninth of its original value
	C	increased to nine times its original value
	D	remains constant

4	 (W) (X) (Y) (Z) The diagram above shows four closed electric circuits. In which circuit will the ammeter reading be the lowest? (*Note that all batteries and ammeters used in the circuits are identical.)*	
	A	Circuit (W)
	B	Circuit (X)
	C	Circuit (Y)
	D	Circuit (Z)

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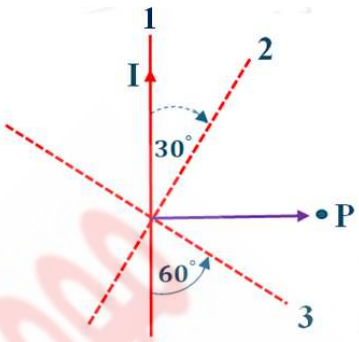
The figure represents a long wire at position (1) through which an electric current of intensity (I). The magnetic flux density at the point P is (B_1). Then, when the wire was rotated in the direction shown in the diagram to reach position (2) and then position (3), the magnetic flux density at point P was (B_2) and (B_3) respectively.,



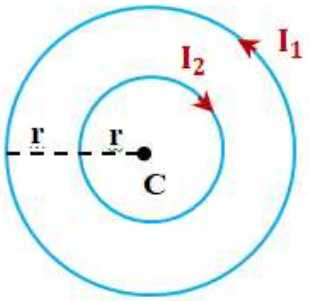
The arrangement of magnitude of flux density at the point P, when the same current passes through the wire in all three positions, is.....

A	$B_1 > B_2 > B_3$
B	$B_3 > B_2 > B_1$
C	$B_1 > B_3 > B_2$
D	$B_2 > B_3 > B_1$

6

Two metal rings in the same plane, each carrying an electric current as shown in the figure. If you know The direction of the resultant of magnetic field at the point C is perpendicular to the page plane and directed outward.

Which of the following is correct?



A	$I_2 > I_1$
B	$2I_2 > I_1 > I_2$
C	$I_2 = I_1$
D	$I_1 > 2I_2$

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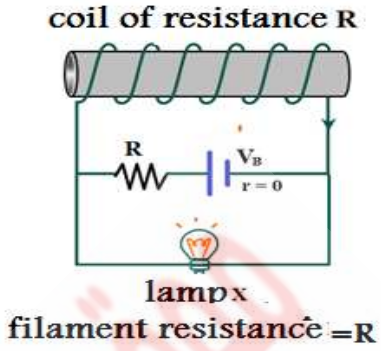
7 The shown figure shows a battery of negligible internal resistance that is connected with an electric resistance (R) , a solenoid of ohmic resistance (R) and an electric lamp (X) with filament's resistance (R).

If the lamp filament (X) burns out, then the magnetic flux density at the midpoint of the solenoid's length.....



A	reduced
B	increased
C	vanished
D	unchanged

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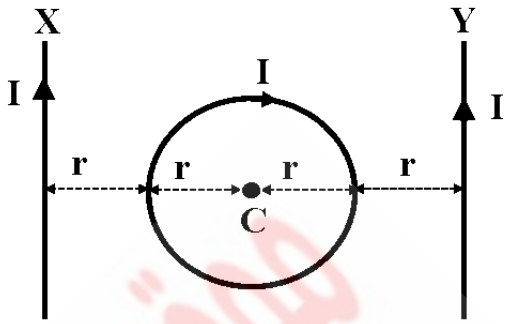
The figure represents

Two long wires (X, Y) and a metal ring at the same plane, with a direct current of intensity (I) passing through each of them.

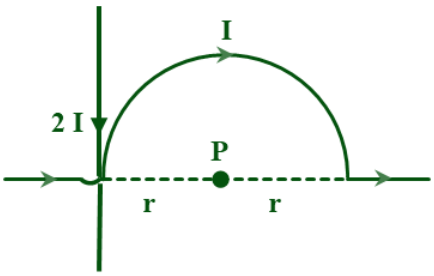
Which of the following changes causes an increase in the net magnetic flux density generated by the three currents at the center of the ring (C) ?



A	Vanishing current in the ring
B	Reversing the direction of the current flowing through the wire X
C	Moving the wire Y, right side of the page
D	Reversing the direction of the current flowing through the two wires Y, X together

9

The figure shows a long straight wire and a metal semi-circular ring, each carrying a direct current. The direction of the resultant magnetic field that is generated due to the two currents at the point P is .....



A	perpendicular to the page inward
B	perpendicular to the page outward
C	Parallel to the page rightward
D	Parallel to the page left ward

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10	Two metal wires X, Y made from the same material ,their lengths are L, 2L respectively, they have the same cross-sectional area, and each is wound into a circular coil with a radius of r ,and Each of them was connected to a direct current source with a potential difference between its two terminals is V .The ratio between the magnetic flux density at their centers $\frac{Bx}{By}$ Equal.....	
	A	$\frac{1}{1}$
	B	$\frac{1}{2}$
	C	$\frac{2}{1}$
	D	$\frac{1}{4}$

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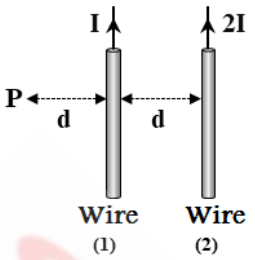
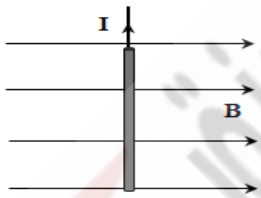
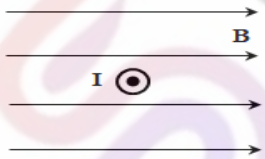
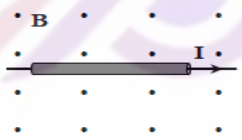
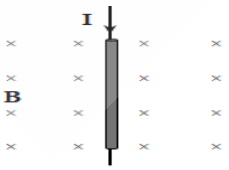
11 Two long, parallel, straight wires, if the total magnetic flux density at the point P equals B. Therefore, the magnetic force acting on a unit length of wire (1) equals.....



A	BI
B	2 BI
C	$\frac{BI}{2}$
D	$\frac{BI}{4}$

12 In which of the following figures is the direction of the magnetic force acting on the wire placed in the magnetic field is parallel to the page and directed to the right side?

A	
B	
C	
D	

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13	**A student moved a magnet towards a solenoid connected to a sensitive galvanometer and let it settle in the middle of the solenoid. The galvanometer pointer momentarily defected and then returned to zero as soon as the magnet settled.** **What is the <u>correct</u> explanation for the pointer returning to zero?**

A	The magnet stopped functioning as a source of magnetic field.
B	Vanishing of attractive force between the magnet and the coil.
C	Vanishing the relative velocity between magnet and the coil
D	The coil's resistance to induced current becomes very high when the magnet is stationary.

14	**Two rings (X) and(Y) are made from same material, where diameter of ring X is double diameter of ring Y. The two rings are placed perpendicular inside a magnetic field, its flux density changing with a constant rate.** **Which of the following choices <u>correctly</u> expresses the relationship between The induced electromotive force (emf) generated in the two rings?**

A	$(emf_Y) = (emf_X)$
B	$2(emf_Y) = (emf_X)$
C	$4(emf_Y) = (emf_X)$
D	$0.5(emf_Y) = (emf_X)$

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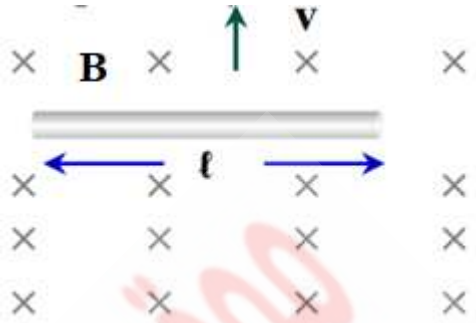
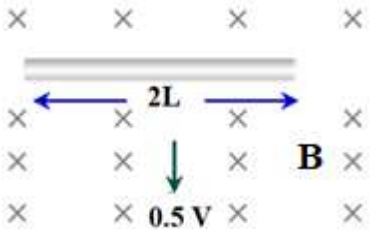
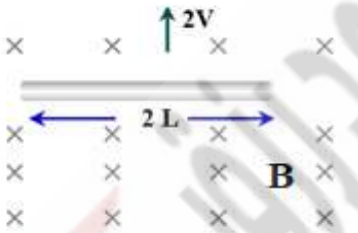
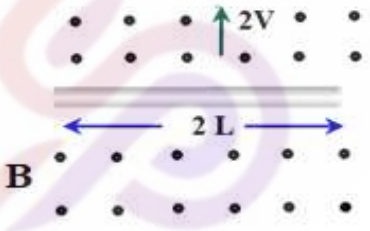
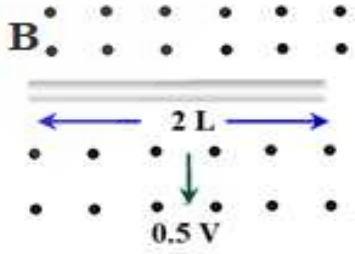
15	A metal rod moves in a magnetic field with a flux density of B to generate an induced electromotive force between the two ends of the rod. Which of the following figures will generate an induced electromotive force identical to that shown in the corresponding figure?	
A		
B		
C		
D		

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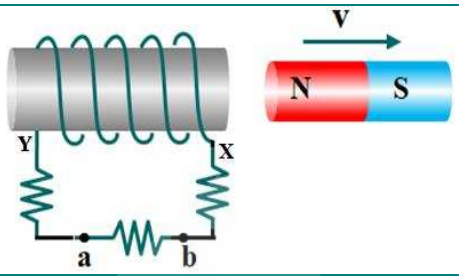
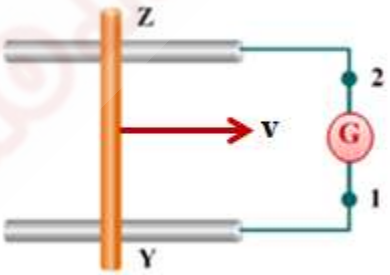
16	In the diagram, when the magnet moves in the direction shown, The point of the highest potential is.....	

A	point (a)
B	point (b)
C	point (X)
D	point (Y)

17	In the figure, a wire YZ is placed in a magnetic field and slides on two metal rods rightward at a constant velocity V, such that the potential of point (1) higher than the potential of point (2). Which of the following choices describes the direction of the magnetic field?	

A	Parallel to the page plane leftward
B	Parallel to the page plane upward
C	Perpendicular to page plane inwards
D	Perpendicular to the page outwards

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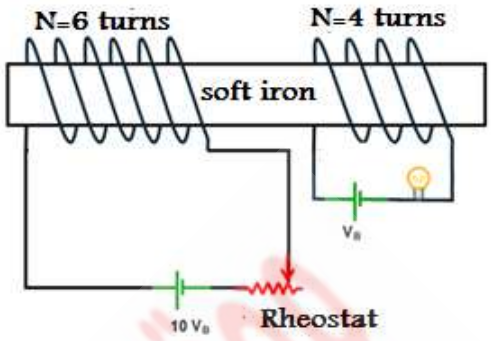
18 The diagram shows a primary coil connected to a battery its electromotive force (emf = 10 V_B) of negligible internal resistance, and the rheostat (variable resistor), while the secondary coil is connected to a battery with an (emf) of (V_B) and a lamp. If the resistance taken from the rheostat is reduced, an induced (emf) of ($3V_B$) is generated in the primary coil. Assuming that the rate of change of magnetic flux through the primary coil is equal to the rate of change of magnetic flux through the secondary coil, the brightness of the lamp.....



A	increases 4 times
B	increases 16 times
C	increases 9 times
D	remains constant

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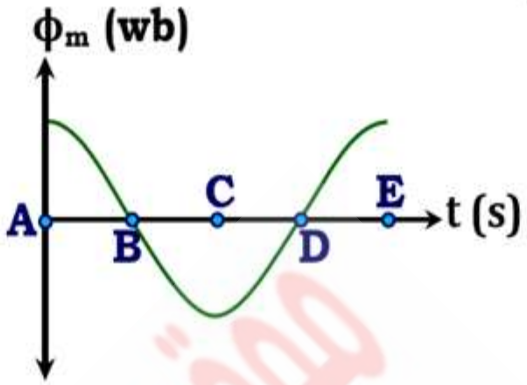
19 **The figure represents the relationship between magnetic flux(Φ_m) which penetrates a coil and time(t).**

Which of the following <u>correctly</u> describes the position of the coil and the induced electromotive force?



	At	Position of the coil relative to the magnetic field	Instantaneous induced electromotive force (emf)
A	Point A	perpendicular	Maximum value
B	Point B	perpendicular	zero
C	Point C	parallel	zero
D	Point D	parallel	Maximum value

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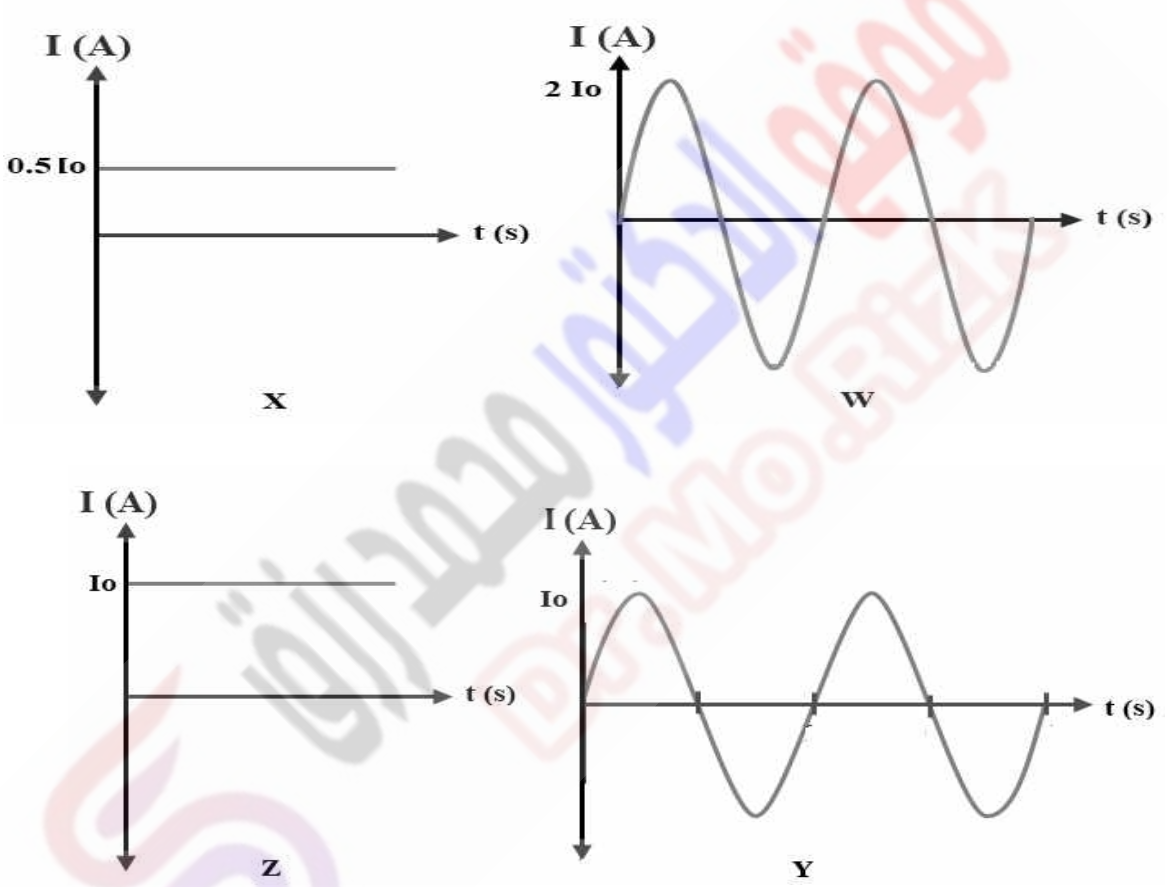
The following figures represent four graphs of currents produced from different sources, each connected to a hot wire ammeter



The correct order for graphs according to the hot wire ammeter reading is .....

A	W > Y > X > Z
B	X > Y > Z > W
C	W > Z > Y > X
D	W > Z = Y > X

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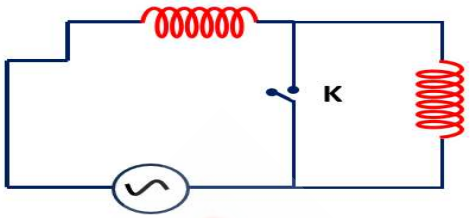
21	In the shown electric circuit,When the switch (K) is closed , the phase angle between the total voltage and the current of the source..... (Neglect the ohmic resistance in the circuit)	

A	reduces
B	increases
C	increases, then decreases
D	remains constant

22	A solenoid with a self-inductance coefficient (L) connected with a battery whose electromotive force at 20V , a current of (5A) passes through the circuit, and when the battery was replaced with an AC source of effective value (20V), a current of (4A) passes through the circuit. so the ratio between the ohmic resistance of the coil and its inductive reactance is equal to	

A	$\frac{4}{3}$
B	$\frac{3}{4}$
C	$\frac{4}{5}$
D	$\frac{5}{4}$

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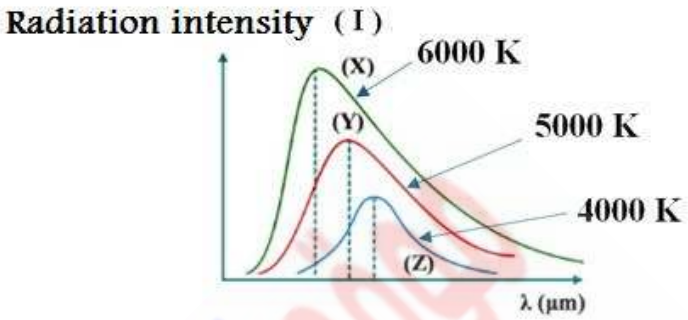
23 The graph represents the relationship between the intensity of electromagnetic radiation **(I)** and wavelength **(λ)** for three glowing bodies, the ratio between the wavelengths associated with the maximum radiation intensity are, respectively $\lambda_z : \lambda_y : \lambda_x$ .....



A	**4: 5: 6**
B	**6: 5: 4**
C	**8: 10: 12**
D	**15: 12: 10**

24 The table shows the mass and speed of three particles. A, B, C.

Arrange the three particles according to the wavelength associated with the motion of each particle.(Note that the mass of the proton m_p is greater than the mass of the electron m_e)

Particle	Mass	Velocity
A	**Electron** m_e	ν
B	**Proton** m_p	ν
C	**Proton** m_p	2ν

A	$\lambda_C < \lambda_B < \lambda_A$
B	$\lambda_B < \lambda_C < \lambda_A$
C	$\lambda_C < \lambda_B = \lambda_A$
D	$\lambda_C = \lambda_B < \lambda_A$

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25	In Compton effect, when a gamma-ray photon collides with a free electron, they both scattered. Which of the following proves that the photon has a particle nature?	
	A	The electron's charge is constant before and after the collision..
	B	The electron's momentum increases after the collision..
	C	The mass of the electron before the collision is equal to the mass of the electron after the collision..
	D	The speed of the photon before the collision is equal to the speed of the photon after the collision..

26	According to Bohr's model of the hydrogen atom, if the energy of the third level is (- E) , the energy of the first level is	
	A	$\frac{-E}{3}$
	B	$-3\,E$
	C	$\frac{-E}{9}$
	D	$-9\,E$

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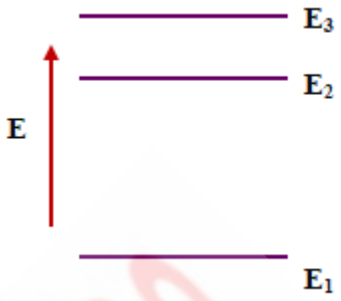
The opposite diagram represents the excitation of an electron in a hydrogen atom from the first level to the third level.

Which of the following figures represents the possible probability of the resulting line spectrum for the return of the electron from the third level to the first level?



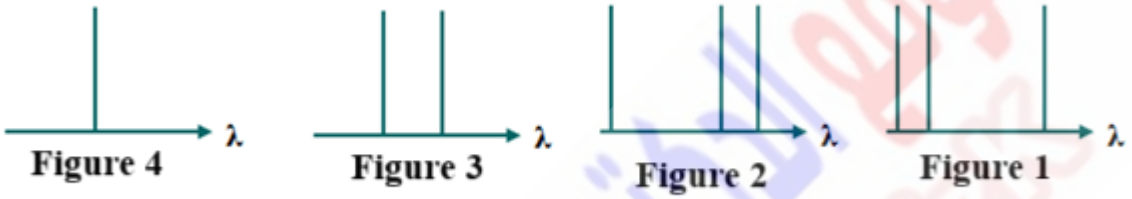


Figure 4 Figure 3 Figure 2 Figure 1

(Note that the direction of increasing wavelength in each figure is towards the right)

A	Figure 1
B	Figure 2
C	Figure 3
D	Figure 4

28

A beam of red laser light can travel a greater distance than a beam of normal blue light of the same intensity because.....

A	a red laser photon has greater energy than a normal blue light photon.
B	the equivalent mass to red laser photon is less than the equivalent mass to normal blue light photon.
C	the speed of a red laser beam is equal to the speed of a normal blue light beam..
D	the angle of divergence of the red laser beam is smaller than the angle of divergence of normal blue light beam.

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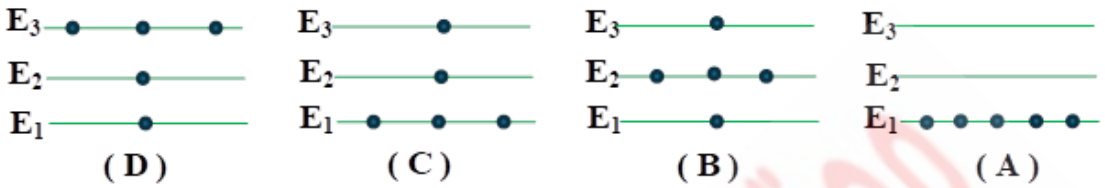
If the level in an atom E_1 represents the ground state, E_2 represents a normal excited state, and E_3 expresses a meta-stable level.



The state from which a laser can be produced is represented by .....

A	Figure (A)
B	Figure (B)
C	Figure (C)
D	Figure (D)

30

In a helium-neon laser, the population inversion state of neon gas atoms in the metastable energy level is due to...

A	The percentage of neon atoms is much lower than that of helium atoms.
B	The presence of two reflective mirrors to amplify the number of photons.
C	Inelastic collision between excited helium atoms and unexcited neon atoms.
D	The presence of a high potential difference that excites neon atoms inside the tube to higher energy levels.

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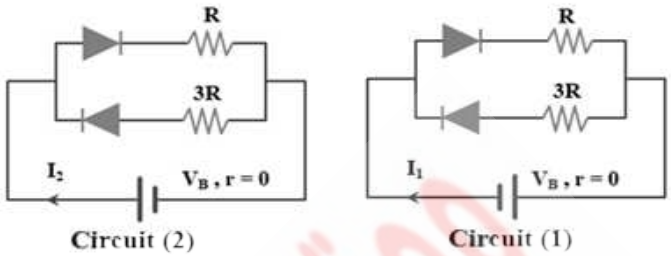
31 The figure represents two electric circuits, if the diode's resistance in forward bias is equal to R and is infinite in the case of reverse bias.

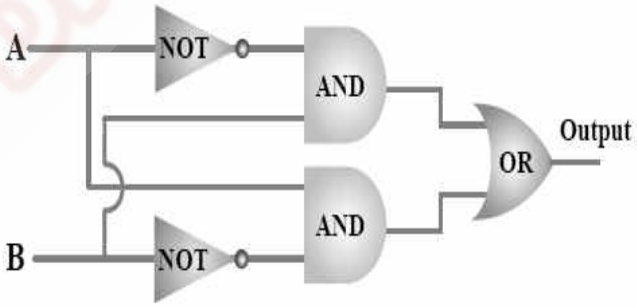


The ratio between the current intensity in each circuit is $\frac{I_2}{I_1} = \cdots$

A	$\frac{1}{2}$
B	$\frac{1}{1}$
C	$\frac{2}{1}$
D	$\frac{4}{1}$

32 The diagram shows some logic gates connected to each other,

Number of possibilities for output (high) is .....



A	0
B	1
C	2
D	3

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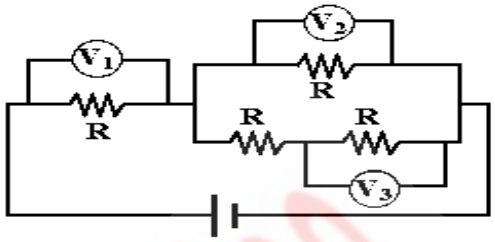
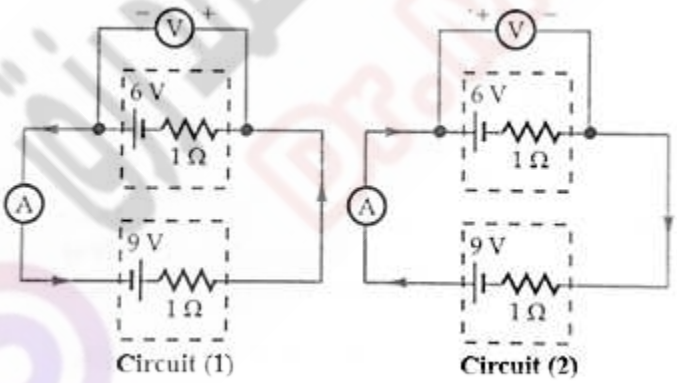
Secondly, objective questions (multiple choice) "Each question two marks"

33 In the electric circuit shown in the figure, the relationship between the readings of the three voltmeters is:.....



A	$V_1 > V_2 > V_3$
B	$V_1 > V_3 > V_2$
C	$V_3 = V_2 > V_1$
D	$V_1 = V_2 = V_3$

34 The figure represents two electric circuits (1 and 2).



Which of the following statements is true??

A	Reading the voltmeter in the circuit (1) greater than the voltmeter reading in circuit (2) by value of 6V
B	Reading the voltmeter in the circuit (2) greater than the voltmeter reading in circuit (1) by value of 6V
C	The ratio between the voltmeter reading in the circuit (1) to The voltmeter reading in circuit (2) equals 6V
D	The ratio between the voltmeter reading in the circuit (1) to The voltmeter reading in circuit (2) equals 3V

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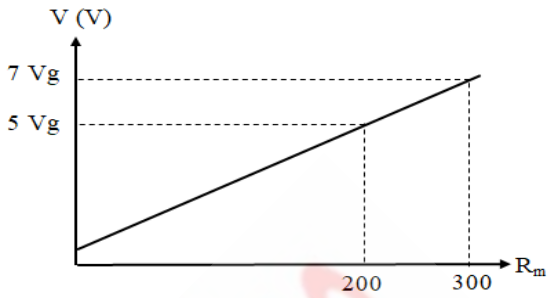
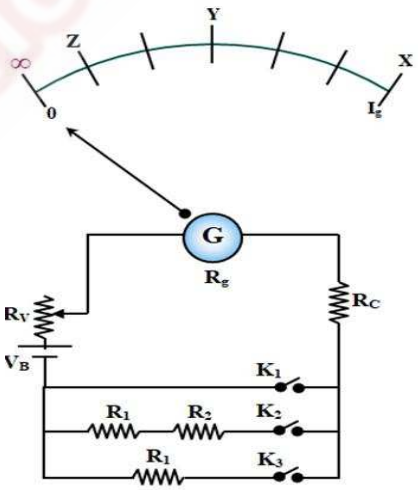
35 The graph shows the relationship between the maximum potential difference (V) that can be measured by a voltmeter and the resistance of the voltage multiplier (R_m). If you know that a voltmeter consists of a galvanometer with a coil resistance (Rg) and a voltage multiplier (R_m), can be changed. then the value of the galvanometer resistance is equal to.....:



A	45 Ω
B	90 Ω
C	50 Ω
D	100 Ω

36 The figure represents an ohmmeter consisting of a galvanometer with a resistance Rg, a fixed resistance Rc, a variable resistance Rv, a battery V_B with negligible internal resistance, and a uniform scale. When K_1 is closed only, the pointer deflects to the x position; when K_2 is closed only, the pointer deflects to the z position; and when K_2 and K_3 are closed <u>together</u> The pointer deviates at the position y.

then the ratio $\frac{R_1}{R_2}$ is equal to.....



A	$\frac{1}{3}$
B	$\frac{2}{3}$
C	$\frac{3}{1}$
D	$\frac{3}{2}$

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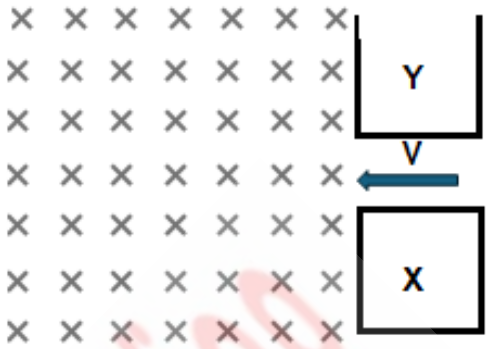
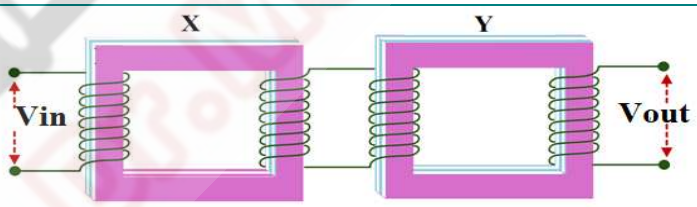
37 The figure shows two metallic conductors (X) and (Y) were pulled by hand on a frictionless surface until their velocity reached (v), then they were left to move freely within a magnetic field as shown in the figure. What happens to the velocity of the two conductors as they enter the magnetic field at the same velocity?



	Conductor X velocity	Conductor Y velocity
A	remains constant	increases
B	remains constant	reduces
C	increases	remains constant
D	reduces	remains constant

38 The figure represents two transformers X and Y, so if the efficiency of each of the two transformers is equal to 80%., the ratio between the power output at the secondary coil of the transformer (Y) to the power supplied to the primary coil in the transformer (X) is equal to.....



A	0,4
B	0.64
C	0.8
D	0.84

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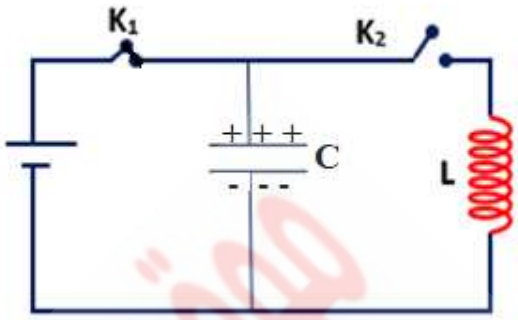
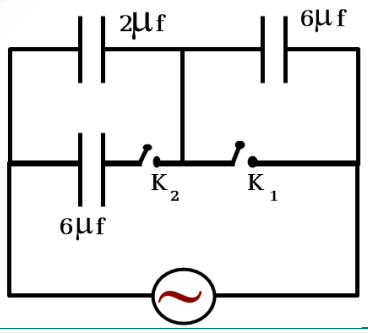
39 The figure shows an oscillating circuit has a capacitor with capacitance $\frac{25}{\pi}\mu F$ and inductor with self-inductance coefficient $\frac{1}{\pi}H$.
When the key K_1 is opened and key K_2 is closed then after a time of 5ms from the moment of switch K_2 is closed,capacitor C becomes .....
(Assuming, there is no loss of energy)



A	Uncharged.
B	Partially charged.
C	Fully charged with a reversed charge.
D	Fully charged with the same charge.

40 The figure represents AC circuit containing a group of capacitors and two switches K_1 and K_2 are opened.
What happens to the potential difference between the two ends of capacitor 2μF when switch K_1 is closed only, and again when switch K_2 is closed only ?



	closing K_1 only	Closing K_2 only
A	increases	increases
B	decreases	decreases
C	increases	decreases
D	decreases	increases

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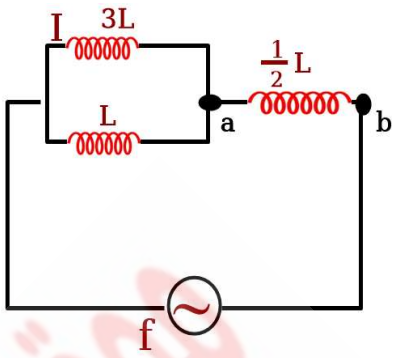
41 The figure represents an alternating current source with a frequency (f) is connected to several negligible ohmic resistance inductors as shown. The potential difference between points a and b is equal to.....



A	$V_{ab} = 4I\pi Lf$
B	$V_{ab} = 2I\pi Lf$
C	$V_{ab} = \frac{1}{2}I\pi Lf$
D	$V_{ab} = \frac{1}{4}I\pi Lf$

42 An electron microscope is used to examine two different viruses ((x and y).

Dimensions of the virus x is four times the dimensions of the virus (y), the ratio between:

$\frac{\text{the potential difference between the cathode and anode required to examine virus x}}{\text{the potential difference between the cathode and anode required to examine virus y}}$ is equal to .....

A	$\frac{1}{2}$
B	$\frac{1}{16}$
C	$\frac{1}{4}$
D	$\frac{1}{8}$

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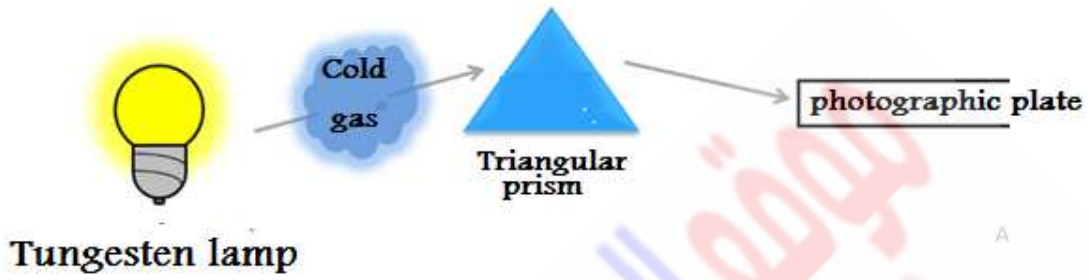
43

The following figure shows light emitted from a tungsten lamp passing through a cold gas, then through a prism. A Spectrum is formed on the photographic plate.



Which of the following choices correctly describes the type of spectrum formed on the photographic plate, and the transitions of gas atoms between their energy levels?

	Spectrum formed on the photographic plate	**Gas atom transitions between energy levels**
A	Emission Spectrum	From lower energy levels to higher levels
B	Emission Spectrum	From higher energy levels to lower levels
C	Absorption Spectrum	From lower energy levels to higher levels
D	**Absorption Spectrum**	From higher energy levels to lower levels

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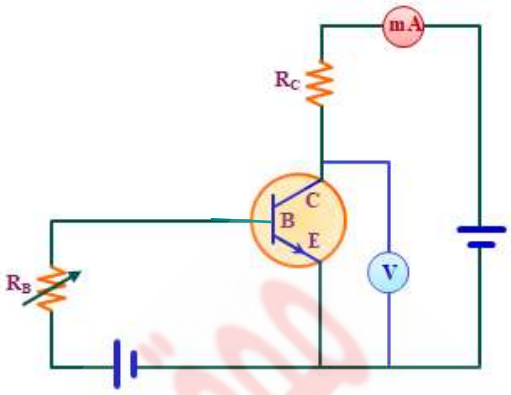
44

In the transistor circuit shown in the figure,

when the value resistance R_B, is decreased



What happens to the reading of the milliameter (mA) and voltmeter (V)?

	Reading of milliameter	Reading of Voltmeter
A	Decreased	Increases
B	Increased	**Decreased**
C	Decreased	**Decreased**
D	Increases	Increases

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Third, essay questions: each question two marks.

45

An alternating current generator, consisting of a rectangular coil of length of 26 cm, and of width 21 cm, has 200 turns. It rotates at a frequency of 1800 revolutions per minute in a uniform magnetic field with a flux density of 0.06 T.

Calculate the Instantaneous induced electromotive force (emf) after two-thirds of the periodic time has passed from the zero position.

46

A beam of monochromatic light with the energy of its photons ($5h\nu_c$) fell on a metal surface of work function ($h\nu_c$). Then an electron is released from the metal surface at a maximum velocity equal to(ν).

Calculate the maximum velocity (in terms of ν)of the electron emitted when the same beam falls on another metal surface whose work function is ($3h\nu_c$)

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